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Conspecific Egg Predation by Florida Scrub-Jays

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ABSTRACT.—We report an observation of egg predation by conspecifics in the Florida Scrub-Jay (*Aphelocoma coerulescens*) at Archbold Biological Station in Highlands County, Florida. This is the first confirmed account of intraspecific egg predation in this threatened and declining species. We observed a group of five jays harass an established breeding pair at their nest that contained four warm eggs. One female intruder alighted on the nest and carried off an egg in its beak. Other intruding females also were seen at the nest and presumably removed two more eggs. The following day, the nest was deserted and contained only one cold egg. We discuss potential reasons for such conspecific egg predation, focusing on resource limitation. We believe that further research in this area is essential for this species in which competition for resources (e.g., nesting habitat) intensifies as suitable habitat declines. *Received 25 September 2001, accepted 14 March 2002.*

Egg predation by conspecifics is seldom observed and its contribution to egg loss in birds has been studied in only a few species (e.g., Vehrencamp 1977, Mumme et al. 1983). Egg loss is particularly noteworthy in the Florida Scrub-Jay (*Aphelocoma coerulescens*), a threatened species endemic to the state. Currently, this cooperatively breeding corvid numbers approximately 4,000 breeding pairs (Woolfenden and Fitzpatrick 1996) and continues to decline (D. Zattau pers. comm.). At Archbold Biological Station it has a mean nest success rate (nests that produce at least one fledgling) of 49% with a yearly range of 29–79% (Woolfenden and Fitzpatrick 1996). However, during our study (2001) nest success was only 38% (S. Schoech unpubl. data). While predation of Florida Scrub-Jay nestlings by snakes, mammals, and birds has been documented (Schaub et al. 1992, Schoech 1999), we know little about the frequency of predation or the identity of predators. In this paper, we describe the predation of Florida Scrub-Jay eggs by conspecifics.

METHODS

We observed color-banded jays residing in the south tract of Archbold Biological Station in Highlands County, Florida (27° 10′ N, 81° 21′ W, elevation 38–68 m; Schoech et al. 1991). Jays in the northern part of the station (demography tract) also were color marked and have been studied by Woolfenden and colleagues since 1969 (Woolfenden and Fitzpatrick 1984). We monitored the south tract jays continuously throughout the nesting season from late February to early June, 2001. We searched for nests daily from 07:30–12:00 EST and were particularly attentive to the nesting activities of jays occupying territories adjacent to the southern boundary of the demography tract. Jays occupying one of these territories in the northwestern corner of the south tract had been supplemented with a high fat and low protein diet provided *ad libitum* in the form of custom-made pellets dispensed from a feeder placed in the center of that territory. Since its establishment in the latter half of January 2001, this feeder had attracted jays from the demography tract immediately to the north. Incursions into south tract territories by increasing numbers of jays from the demography tract were thought to be the result of a wildfire that burned 259 ha of the 2,080-ha main property of Archbold Biological Station. The fire burned in the center of the demography tract on 12 February 2001 before any resident jays had constructed nests. Many territories, including some bordering the south tract, were extensively burned. Under these unusual circumstances, we describe below a conflict between neighboring Florida Scrub-Jays.

RESULTS

On 19 April 2001 we searched for a nest in the northernmost territory of the south tract. A fire lane running east-west separated the south tract from the northern demography tract. We found a group of nonbreeding jays (hereafter, the northern group) consisting of four females and one male from the demography tract perched on the north side of the fire lane. The female breeder of this group had

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been paired with the 15-year-old male for approximately one week. They did not attempt to nest during the 2001 breeding season (the male would later disappear and the northern group disband by the end of January 2002).

We walked south of the fire lane after observing the breeding male and female of the northernmost territory of the south tract (hereafter, southern pair) and searched the vegetation for this pair's first nest of the season. We followed the female for approximately 15 min; during this time her mate disappeared. The southern female soon started scolding when jays from the northern group entered the territory and approached to within 20 m of her. At 08:25 we found the nest of the southern pair, which contained four warm eggs, while the southern female was ≤3 m from the nest scolding us. She flew from branch to branch while head-bobbing, a movement expressed during territorial encounters, and vocalizing with both warning calls and hiccup calls, the latter a female-specific territorial vocalization (Woolfenden and Fitzpatrick 1984). As we moved away to mark the location of the nest, the northern group of jays moved to within 10 m of the nest. Several of the intruding females exchanged scolding vocalizations with the southern female, who head-bobbed continuously and hiccupped. The southern female chased one of the intruding females from the vicinity of her nest, but while she was gone, one of the unpaired northern females landed on the nest and looked inside. The southern female returned to her nest, driving the northern female away before returning to the nest to incubate the eggs. After ≤5 s, the southern female again left her nest to chase off another intruding female. Again, the southern female returned to incubate her eggs, and again chased off another bird. This time, in the absence of the southern female, the paired northern female landed on the nest and looked inside. She reached into the nest cup and departed with an egg secured in the tip of her bill. The unpaired northern female returned to the edge of the nest and also looked inside. However, at that time the southern female returned to her nest and drove the intruder away, after which she inspected the contents of her nest for several seconds. She left the nest once more to drive the northern group of jays out of her territory. The entire interaction lasted about 5 min.

After the predation event, the southern male returned. All intruding jays remained north of the east-west fire lane while the southern pair perched on the south side of the fire lane from where they watched the northern jays and occasionally head-bobbed. The southern female hiccupped several more times, but otherwise her vocalizations and those of the northern group ceased. At 08:45 we left the area.

SJR checked the nest again at 16:30 on the same day and only one egg remained. The following day the one cold egg remained when the nest was visited at 15:05, but no jays were observed in the area; the pair had abandoned the nest. Subsequently, the southern pair built a second nest and the female laid one egg, but this was found cold and abandoned on 11 May 2001. The southern pair subsequently bred during 2002.

DISCUSSION

Nonbreeding Florida Scrub-Jays are suspected of removing eggs from nests of conspecifics, based upon a single observation of a bird with a bill moistened perhaps from consumption of a conspecific's egg (Woolfenden 1973). Here, we directly observed one of a group of nonbreeders from a neighboring territory intrude into a breeding territory and take an egg from a nest of conspecifics. We assume that two more eggs from the nest were taken in the same way in our absence. Whether this form of egg loss contributes significantly to nest failure rates has yet to be determined.

We can only speculate on why the eggs were removed. The eggs may have been consumed. During the breeding season we observed members of the northern group and of the southern breeding pair at the feeder in the northwestern corner of the south tract, suggesting that there was foraging overlap between the two groups. With much of their foraging habitat burned by wildfire, the jays from the northern group may have been forced to forage farther afield, and the discovery of a conspecific's eggs may have presented them with an easy foraging opportunity. Florida Scrub-Jays readily take eggs and young of other species (Sprunt 1946). Similar behavior also has been reported in its congeners, the

Western Scrub-Jay (*A. californica*; Sprunt 1946, Carmen 1988) and the Mexican Jay (*A. ultramarina*; Brown 1994). Conspecific egg predation has been reported in the latter species (Trail et al. 1981).

Alternatively, destruction of eggs might be a mechanism of interference competition whereby conspecifics effectively space their nesting activities in the available habitat. For example, Quinn and Holroyd (1989) found that House Wrens (*Troglodytes aedon*) destroy the nest contents of Tree Swallows (*Tachycineta bicolor*) and of conspecifics in response to the limited availability of nest cavities. Since we report a case of possible intraspecific, as opposed to interspecific (e.g., Creighton and Porter 1974), competition, resource limitation might be even more intense under the conditions described above.

We observed the paired northern female removing the first egg, but other females may have removed two of the remaining eggs. No females of the northern group bred successfully during 2001 and most were unpaired. Only they, and not the male, approached the nest of the breeding pair while we watched. By removing the eggs, perhaps the unpaired females would improve their chances of acquiring a different type of resource: a mate. This argument also might apply to the paired northern female, given the advanced age of her mate. In some species, infanticide by male birds facilitates the acquisition of a new breeding territory (Robertson and Stutchbury 1988), a new mate (Kermott et al. 1991), or both. Egg destruction by female conspecifics is common in Bronze-winged Jacanas (*Metopidius indicus*; Butchart 2000) and results from the polyandrous mating system that creates a large population of unpaired females who challenge resident females for access to mates and territories. While Florida Scrub-Jays are socially and genetically monogamous and maintain strong pair bonds (Woolfenden and Fitzpatrick 1996, Quinn et al. 1999), divorce has been reported (Woolfenden and Fitzpatrick 1996). In this study, egg removal almost certainly caused the nest abandonment by the breeding pair, which perhaps could have led to the weakening of the pair bond and ultimately the liberation of the southern male and his breeding territory. However, this scenario is unlikely in our study area given the low annual divorce rate of 6% (Marzluff et al. 1996).

Whatever the underlying reasons for the observation described above, we cannot dismiss egg predation by conspecifics as being only a trivial contributor to nest failure in the Florida Scrub-Jay. In over 30 years of intensive study (Woolfenden and Fitzpatrick 1996), our account is the only direct observation of conspecific egg predation in the Florida Scrub-Jay. It is therefore tempting to consider this behavior rare in this species, but with continuing loss of suitable breeding habitat, such rare behaviors may become more common. Intraspecific egg predation in Florida Scrub-Jays warrants more detailed study.

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Effects of Fires on Foraging and Breeding Wading Birds in the Everglades

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ABSTRACT.—Nests, eggs, and chicks of nesting wading birds were unharmed by two fires in the Everglades. However, at least 50 adult White Ibises (*Eudocimus albus*) foraging away from the breeding colonies were killed during one fire. These results are counter-intuitive given that well-flighted adult birds seem more capable of escaping a fire than immobile nests or eggs. Nests probably were unharmed because of their location in wet willow (*Salix carolina*) and buttonbush (*Cephalanthus occidentalis*) islands. The adult birds foraging in a small cattail (*Typha angustifolia*) stand may have been trapped by flames in surrounding tall sawgrass (*Cladium jamaicense*) or debilitated by smoke inhalation. These observations provide insight into the direct effects of fire on wading bird breeding colonies and individual survival. *Received 27 June 2001, accepted 11 March 2002.*

Many studies have documented relationships among habitat, fire, and avian abundance (Howard et al. 1959, Vogl 1973, VantHul et al. 1997, Reynolds and Krausman 1998). However, the direct effects of fire on bird survival are rarely reported (Bigham et al. 1964, William and Stasiak 1979). Birds directly affected by fire usually are ground nesters whose eggs or chicks are vulnerable to ground fires (William and Stasiak 1979) or waterfowl that are flightless during wing molt (Hohman et al. 1992). Flighted, adult birds seem well equipped to escape fire and smoke. Here we report on the effects of fires on large breeding colonies of wading birds in the Ev-

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